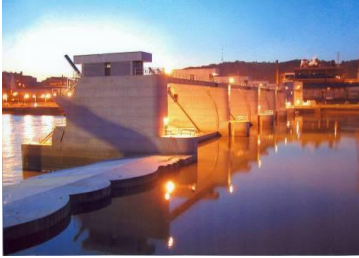


Project Overview

Monongahela River Locks and Dams 2, 3, and 4 (Lower Mon)

Updated: April 2021



**New Braddock Dam
River Mile 11.3
Replaced dam originally built in 1906
Braddock, PA**



**Existing Locks and Dam 3
River Mile 23.8
Originally built in 1907
Elizabeth, PA**



**Existing Lock and Dam 4
River Mile 41.5
Originally built in 1936
Charleroi, PA**

Project Synopsis

Locks and Dams 2, 3 and 4 on the Monongahela River in Allegheny, Washington, and Westmoreland counties in Southwestern Pennsylvania, are the three oldest currently operating navigation facilities on the Monongahela River. These locks experience the highest volume of commercial traffic on the entire Monongahela River Navigation System and the pools created by these facilities provide industrial and municipal water and are popular with recreational boaters.

The Lower Mon Project replaced the nearly 100-year-old fixed-crest dam at Braddock Locks and Dam with a gated dam, will construct two new larger locks at Locks and Dam 4 in Charleroi, and will remove Locks and Dam 3 in Elizabeth.

These improvements will cause noteworthy changes to the Monongahela River. Removal of Locks and Dam 3 will create a single pool, between Braddock and Elizabeth, and cause the river to rise a nominal 5'. From Elizabeth to Charleroi, the river will drop a nominal 3.2'. Even though familiar river levels will change, there will be NO increase in flooding events along the Monongahela River.

Relocations: There are several facilities along the Monongahela and Youghiogheny Rivers that will be adversely affected by the project pool changes. Examples are: Riverfront Park in Elizabeth and the public boat launch ramp in New Eagle. The Lower Mon Project will fund the design and construction of municipal owned facilities to correct these adverse effects. However, all costs associated with changes to private or commercial facilities, along these navigable waterways, are the responsibility of the facility owner. Although this will involve some expense in the short term, cost-effective long-term advantages will result from a 30-mile unimpeded section of river between Braddock and Charleroi.

To provide the authorized 9-foot navigation depth, approximately 1.2 million cubic yards of riverbed material, mostly sands, gravels, and coal fines, will be dredged from the river bottom upstream of Elizabeth. These materials will be used to reclaim a former slag dump in Washington County, near Victory Hills, PA.

Project Benefits

Project benefits are estimated to be over \$220 million per year. Project benefits are generated by shipping bulk goods via barge as opposed to shipping by rail or truck. By reducing the transportation costs of coal, for example, electrical suppliers that use coal to produce electricity can provide electricity at a lower rate, thus reducing costs to electrical customers. Additional benefits are derived from having less maintenance on old and unreliable facilities. Other benefits include keeping our roadways free from excessive truck traffic.

Imagine the reduction of wear and tear on our local roadways, increased safety for the public, and reduced vehicle emissions as you consider this:

- One jumbo barge is equivalent to 15 railroad cars or 58 tractor-trailer trucks.
- A 15-barge tow equates to 225 railroad cars or 865 tractor-trailer trucks.

Ongoing Major Construction:

- Pool 3 Dredging (anticipated to be complete in FY2022)
- Stilling Basin (anticipated to be complete in FY2022)
- Charleroi River Chamber and Control Tower (anticipated to be complete in FY2024)

Projected Near Term Construction:

- Multiple Municipal Owned Facility Relocations (scheduled between FY2022 and FY2025)
 - Locks and Dam 3 Removal (contract award scheduled in FY2022, breach of Dam 3 FY2024)
- At this point, the project will produce over 90% (or \$198 million) of the project benefits.

Remaining Work:

- Port Perry Railroad Bridge Relocation (indefinitely deferred)
- Charleroi Land Chamber (indefinitely deferred)

Project Funding

This project is cost shared 50/50 with the Inland Waterways Trust Fund (IWTF) and the General Treasury. The IWTF is a tax levied on the diesel fuel used by the commercial waterways transporters (carriers). The General Treasury portion of the project funding is generated from Federal tax revenues.

The project is fully funded with a total allocation of \$1,124 Million. Of that amount, the project has invested approximately \$905 Million. The \$219 Million difference between these figures, for the most part, represents funding not yet expended on future and ongoing contracts.

American Recovery and Reinvestment Act (ARRA)

The FY 2009 ARRA had identified \$84 million to continue construction on the Lower Mon project. Through Fiscal Year 2015 ARRA funds in the amount of over \$68 million were invested in the Charleroi River and Guard Walls. The availability of these funds allowed to project to continue in the absence of other funding.

Braddock Dam

In June 2002 when Dam Segment #2 was set-down onto its foundation, Act One of the Braddock Dam “In-the-Wet” construction project was completed to rave reviews. For the 1st time in civil engineering history, an inland navigation dam was created using innovative float-in technology, wherein two massive concrete dam segments, fabricated on land, were launched, floated into place, and submerged onto a constructed large diameter drilled shaft foundation.

On July 26, 2001 Braddock Dam Segment #1, weighing 16,800 tons, was floated out of its casting basin in Leetsdale, PA and into the Ohio River to begin a groundbreaking 27.5 river mile trek. On February 27, 2002 Segment #2, weighing 13,500 tons, embarked on its 27.5 mile voyage. The segments were towed with precision through Dashields and Emsworth Locks on the Ohio River, nearly filling the lock chambers. After passing through what was then Lock 2 on the Monongahela River, the segments were moored at an outfitting pier along the left bank of the River in Duquesne, PA to prepare them to be sunk onto the drilled shaft foundation at the Braddock project site. Their 15-hour trips were major media events in western Pennsylvania. The flotilla – dam segment, 3,300 HP primary tow boat, two assistance tow boats and escort vessels – traveled in the heavily used waters of the Port of Pittsburgh as thousands of on-lookers lined the riverbanks and cheered while others tracked their progress through television and radio updates.

On December 5, 2001 and June 19, 2002, Segment #1 and Segment #2, respectively, were transported to the Braddock Dam site, positioned and set down on their respective underwater foundations. Safely set-down on their

foundations, Segments #1 and #2 formed the lower third of the pier bases and overflow sections of the five-bay gated navigation dam. The balance of the dam was constructed from floating plant above the water. The new Braddock Dam became fully operational in April 2004.

The Braddock Dam portion of the Lower Mon project incorporated significant new and innovative business practices with respect to design, construction, procurement and contract management that have received notable interest and endorsement not only with the federal government, but the engineering community as well. The Braddock Dam has been recognized in many engineering periodicals including [Civil Engineering](#) magazine. [Engineering News-Record](#) named it one of the top 25 newsmakers of the year in 2002. In 2003 the [Engineers' Society of Western Pennsylvania](#) honored Braddock Dam as its Project of the Year. In 2004 the project was a finalist for the [American Society of Civil Engineers'](#) Outstanding Civil Engineering Achievement Award. In 2005 it received the Civil Engineering Achievement Award from the [Pittsburgh Section](#) of the American Society of Civil Engineers. And finally, the History Channel's "Modern Marvels" highlighted the Braddock Dam construction in its 1-hour documentary on the history of the U.S. Army Corps of Engineers.

Charleroi Locks

The new Charleroi Locks, with both lock chambers 84' wide by 720' long, are an essential component of the "two-for-three" replacement plan that will lower the downstream operating pool by 3.2' after the removal of Locks and Dam 3. This pool lowering, driven by major structural problems at Locks and Dam 3, will result in major impacts to existing Locks 4. Major impacts to Locks 4 include differential loading on the lock walls increasing to unacceptable levels and water depths over the lock chamber sills and struts becoming less than required.

Existing Locks 4 were completed in 1936 and are thin, unreinforced, non-air entrained concrete sections founded on wood piles. Concrete struts were constructed across the floor of the locks to stabilize the walls prior to raising the upper pool by 6' in 1967 when the new gated dam was built. At that time, the up-river Maxwell Locks and Dam were constructed to replace several old middle Monongahela River projects, and a new dam was constructed at Locks and Dam 4 to raise the pool to the new Maxwell project.

There are six facilities upstream of Locks and Dam 4 and all have 84' wide lock chambers. Maxwell Locks, the first upstream project, has twin 720' long by 84' wide chambers. When Locks and Dam 3 is removed as part of the Lower Mon project, all locks downstream of Locks and Dam 4 will have a 110' wide main chamber. Since the existing chambers at Locks and Dam 4 are each only 56' wide, constructing larger chambers will remove a "bottleneck" from the system that forces the complicated and hazardous process of tow disassembly and reassembly in order to "double lock" typical tows through Locks 4. Larger chambers will provide additional capacity to process traffic. In sum, the plan to construct new and larger locks at Locks and Dam 4 is driven by the age and condition of the existing locks as affected by the planned lowering of the downstream pool and the rise in the upstream pool that was made in the 1960s, and in the benefits of removing a bottleneck (i.e., the last remaining 56' wide chamber) to transportation on the Monongahela River.

Construction of the new locks began in 2002 with a \$7.9 million contract to prepare the site by construction of a new access road, bridge and parking areas as well as operations and service buildings. Another contract for demolition of the river lock chamber was awarded in 2003 for \$12.9 million. This contract included removing the river chamber lock chamber floor struts, timber and steel piles, and installing stabilizing struts and coffercells to prepare for the eventual construction of the new lock's middle wall within the area of the existing river chamber. Continuing the Lower Mon Project's award winning trend, the design for this contract earned the 2006 Grand Award for Engineering Excellence from the American Council of Engineering Companies of Ohio. The ongoing contract for construction of the new river wall was awarded in 2004. Construction began in the spring of 2005 and is scheduled to be complete in 2016. In 2009 a contract was awarded for \$28M to construct the Upper and Lower Guard Walls at Charleroi Locks. This work was completed in 2013. In January 2012, the River Chamber Preparatory contract was awarded for \$7.7M. In 2013 the district awarded a \$15.2M contract to construct the Charleroi Emptying Basin. In 2014 a \$58M contract was awarded to construct Charleroi Locks Middle Wall monoliths M22-M27. In late fiscal year 2015 a contract to construct the remainder of the Charleroi River Chamber was awarded for \$241M as a base contract with 5 awardable options. The Charleroi River Chamber will be completed as early as 2024.

Dredging

The authorized project will maintain a 9-foot-deep by 300-foot-wide navigation channel between Braddock and Charleroi. No channel dredging is required from Braddock to existing Locks and Dam 3, at Elizabeth. From Elizabeth to Charleroi the pool elevation will be lowered a nominal 3.2 feet. This change in pool elevation (between Elizabeth and Charleroi) will require that the river bottom be excavated (dredged) to ensure a 9-foot-deep navigation channel. Dredged material will be placed in a permitted disposal area near Victory Hills, approximately 2 miles south of Donora, PA.

The material to be dredged from the river is comprised mostly of sands, gravels, and coal fines. The material to be placed in the permitted fill placement area is not hazardous. A rigorous sampling plan was previously conducted, and areas of “contamination” were identified, within the navigation channel, have already been excavated and placed in a regulated disposal facility. Environmental due diligence will continue to be conducted to assure that excavated materials are handled appropriately. Dredging will be complete in 2022.

Locks and Dam 3 (Elizabeth)

Locks and Dam 3 will be completely removed when one new operational chamber is completed at Charleroi, pool 3 dredging is completed, and the project funded relocations in pool 2 are completed. Upon removal of L/D 3 the project will begin to capture over 90% of the project benefits. Locks and Dam 3 can be removed as early as 2024.

Relocation of Municipal Facilities

The pool changes associated with the Lower Monongahela River Project will adversely affect many shoreside “Publically owned” facilities. In accordance with the discretionary authority afforded the Chief of Engineers under Section 111 of the River and Harbor Act of 1958, the relocation of these publically owned facilities may be funded by the project, provided they meet certain criteria, notwithstanding permit requirements related to navigation servitude. The Lower Monongahela River Project will fund the design and relocation of many municipal facilities along the Monongahela and Youghiogheny rivers adversely affected by the pool changes.

A railroad bridge owned and operated by the Norfolk Southern Corporation will not meet the minimum established U.S. Coast Guard vertical clearance requirement of 42.5 feet from normal pool elevation. The Corps is authorized to elevate this bridge, however, recent information related to a lack of impact to navigation may remove this bridge from our project requirements. The Corps and the US Coast Guard have engaged in discussions related to the outlay of Federal funding to adjust a facility that may have little impact from our project. The Corps’s current plan is to defer this work.

Privately owned facilities, within navigation servitude along the Monongahela and Youghiogheny rivers, adversely affected by the pool changes are to be adjusted at the owner’s expense. Facilities within navigation servitude are subject to the provision of Section 10 of the Rivers and Harbors Act, which requires facility owner to bear the cost of any adjustments necessary due to changed pool conditions. The Corps of Engineers and the Port of Pittsburgh Commission, in the past, have established a forum to continue dialogue with these affected private owners on likely impacts, technical assistance available from the Corps, and potential sources of non-project financial assistance.

Pool Changes

- Pool 2 - The current operating pool between Braddock Locks and Dam (L/D) and L/D 3 is 721.8. This is 3.1 feet above the normal operating pool to reduce hydrostatic loads on L/D 3. Upon removal of L/D 3, the new pool 2 will extend from Braddock L/D to Charleroi L/D at elevation 723.7.
- Pool 3 – Pool 3 will be lowered 3.2 feet, from elevation 726.9 down to elevation 723.7. Pool 3 cannot be lowered until a new River chamber is operational at Charleroi, pool 3 dredging is completed, and L/D 3 is removed. It is anticipated that the earliest Pool 3 can be lowered will be in the 2022-2023 timeframe.

Images of Ongoing Construction at Charleroi Locks and Dam



4 of 4

